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CHAPTER 1

INTRODUCTION

This document describes the current system of Mapping Sciences. The main focus of Mapping Sciences is: Photogrammetry, Remote Sensing, and Cartography. Photogrammetry is the science or art of obtaining reliable measurements by means of photographs or photographic images. Remote Sensing is the blanket coverage of a specific area for special coverage, such as checking forest fire damage or determining vegetation types. Remote Sensing involves the use of photographic and earth resource satellite tools to gather information. Cartography is the art, science, and technology of making maps. Cartography is concerned with all stages of evaluation, compilation, design, and drafting required to produce a new or revised map document from all forms of basic data (definition from the GLOSSARY OF TECHNICAL TERMS IN CARTOGRAPHY).

This document is organized as follows: Section 1 - Introduction explaining the scope and structure of the document; Section 2 - Data Flow Diagrams (DFDs) illustrating the current method of processing for the Mapping Sciences program; Section 3 - Process List providing an alphabetical list of processes defined, their level, and the page references for each process in the DFDs and the input/process/output narratives if the process is at a primitive level; Section 4 - Input/Process/Output Narratives (IPOs) describing each process primitive in detail including definitions of steps taken or decisions made; and Section 5 - Data Dictionary and Cross Reference List defining all data flows appearing on the DFDs.

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TECHNICAL ACTIVITIES

* MAPPING SCIENCES *

For:

U.S. Department of the Interior
Bureau of Land Management
ALMRS-GIS Project Office - DSC
Denver Federal Center
Denver, Colorado 80225

By:

National Systems & Research Co.
7150 Campus Drive, Suite 255
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CHAPTER 2

DATA FLOW DIAGRAMS

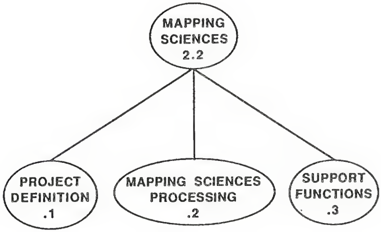
The current Mapping Sciences program is presented here as a series of data flow diagrams that show the sources and destinations of data, identify and name processes, identify and name data that connect sources and destinations of data, and describe data stores that are accessed. Each function may be broken down into a more detailed flow diagram. The hierarchical structure of each process is identified by decimalized identifiers.

When it is no longer useful to decompose a process, the process and its logic are described by input/process/output narratives. This process is said to be at a primitive level.

Standard representations on the DFDs are:

1. an ellipse is a process;
2. a rectangle is an external entity (generally outside of BLM control);
3. a set of brackets is an internal entity (generally thought of as an off-page connector or a pointer to a generic type of process);
4. a line is a data flow;
5. arrows at the ends of lines indicate the direction data is flowing; and,
6. two parallel lines are a data store (generally representing logical groupings of data rather than individual records or data components).

MAPPING SCIENCES VISUAL TABLE OF CONTENTS



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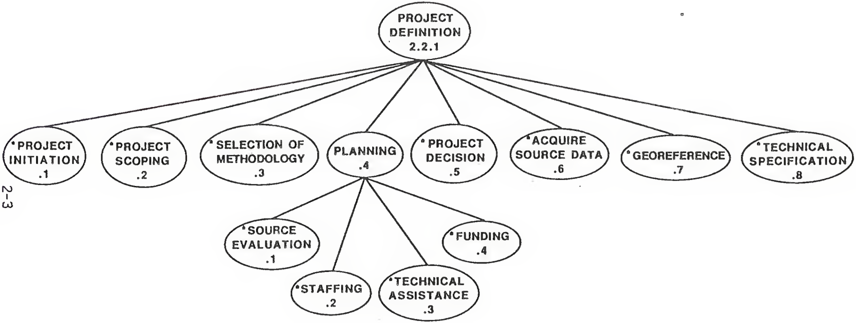

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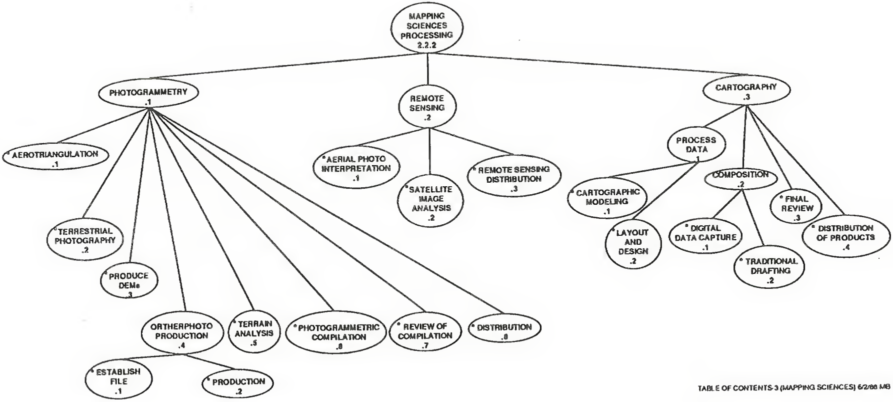

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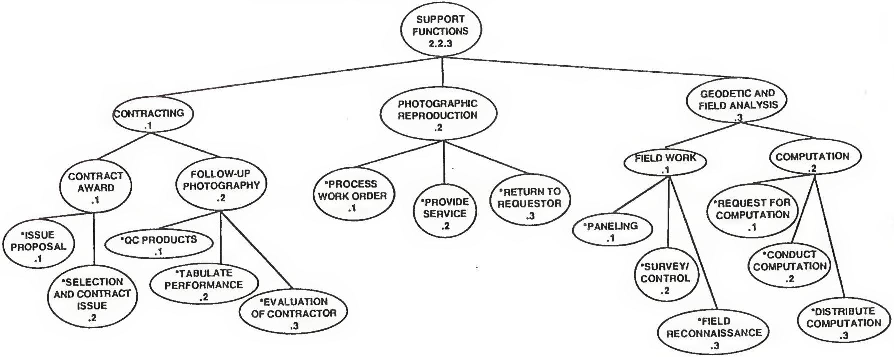

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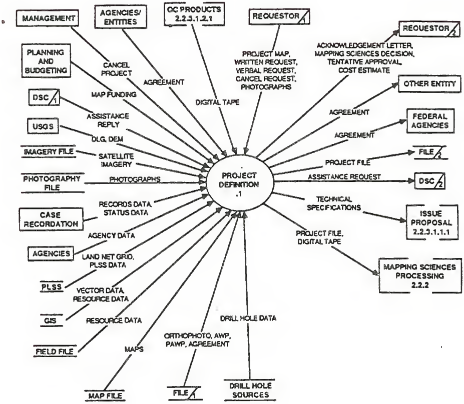

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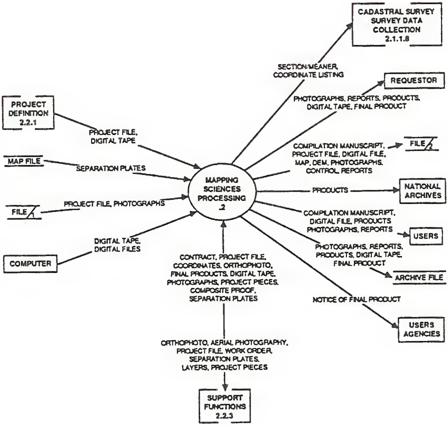
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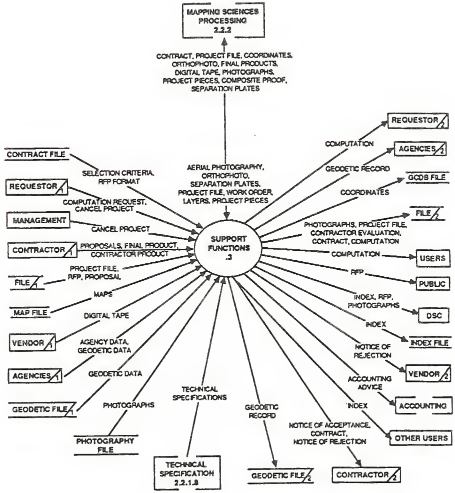
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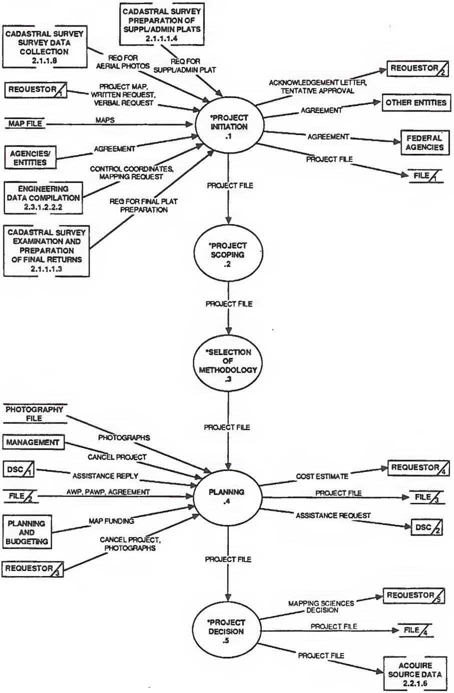

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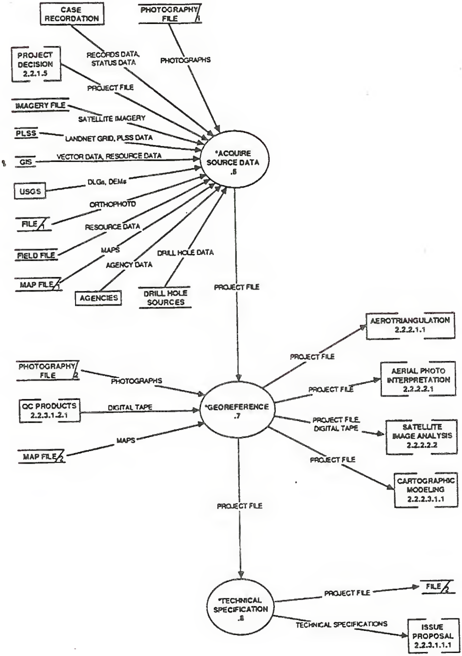

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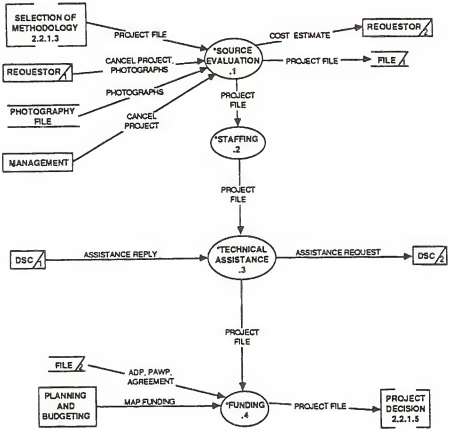

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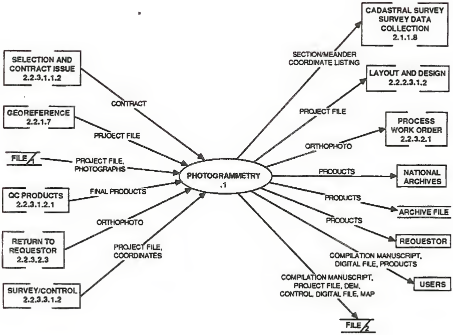
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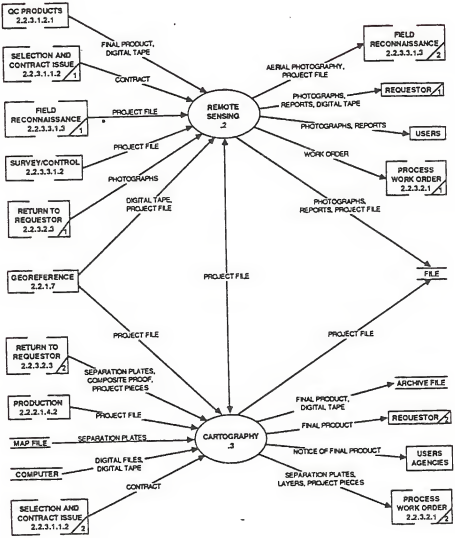
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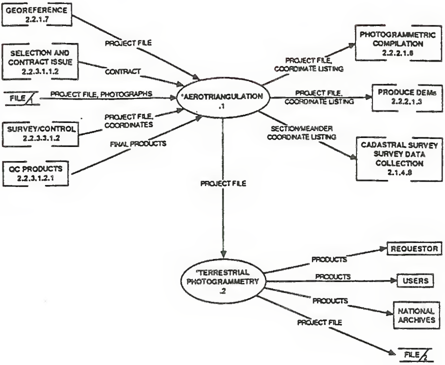
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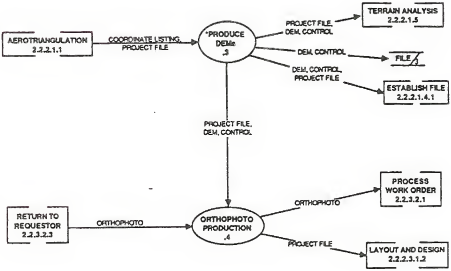
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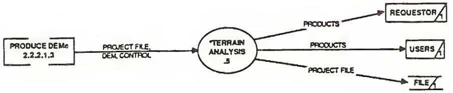

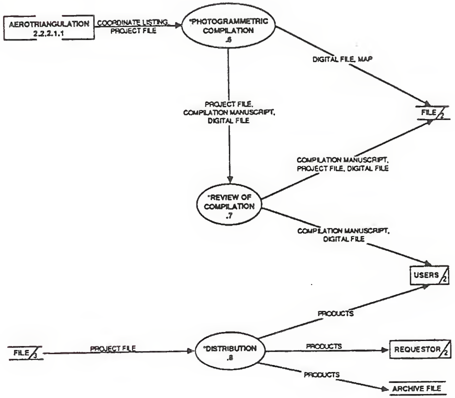

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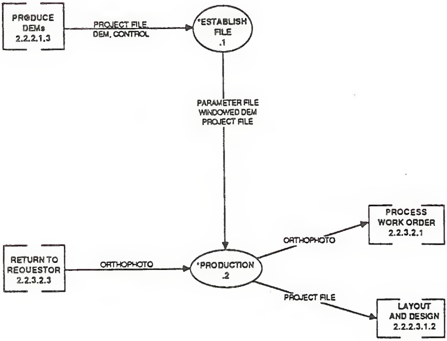

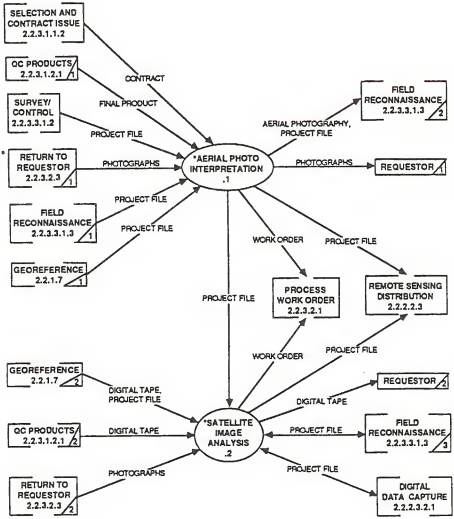
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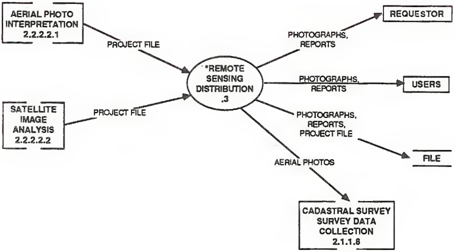
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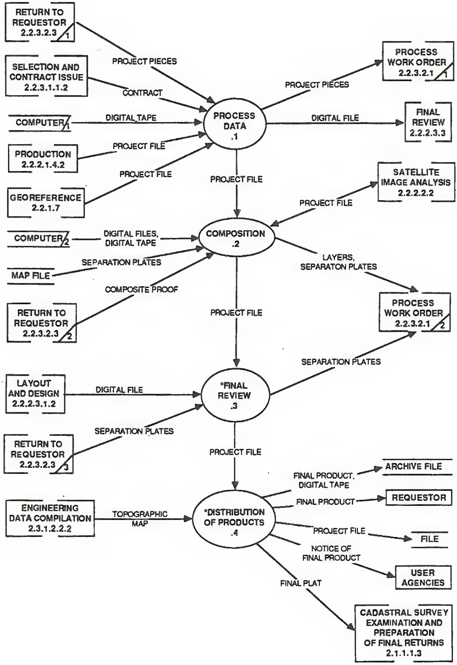

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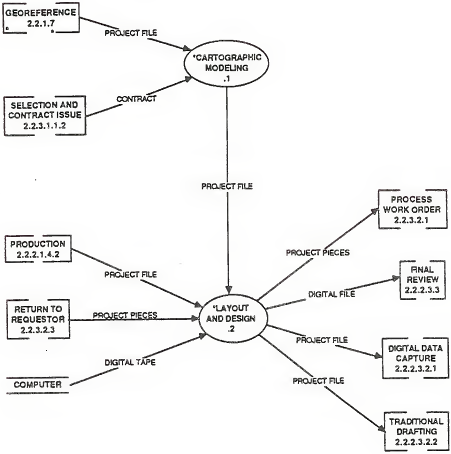

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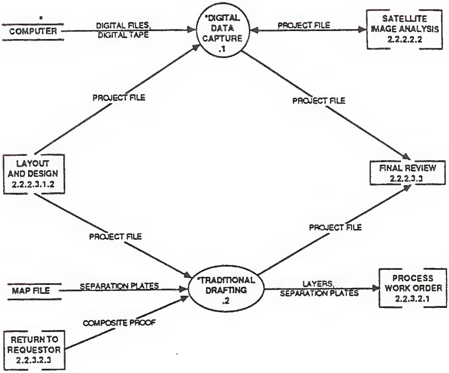

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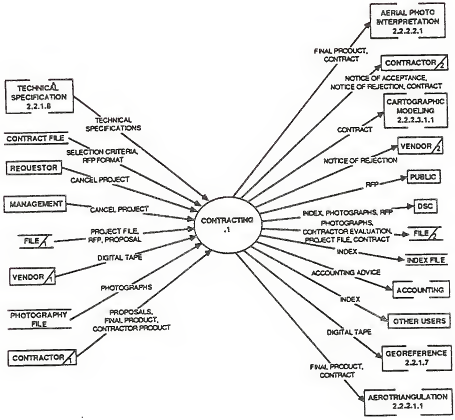

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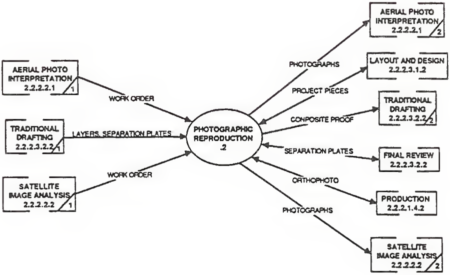
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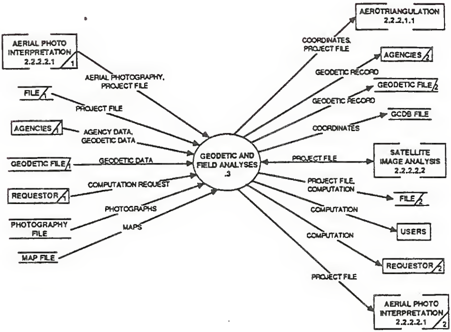
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IDENTIFIER: 2.2.2.3.1

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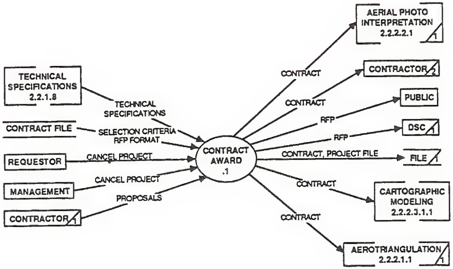
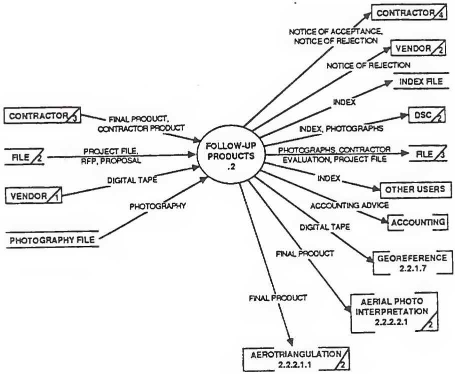
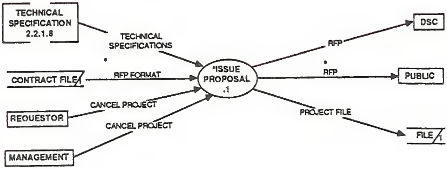
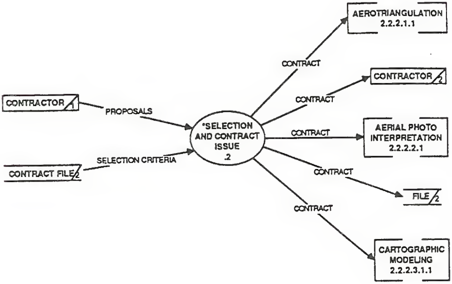




TECHNICAL ACTIVITIES: MAPPING SCIENCES
PARENT PROCESS NAME: CONTRACT AWARD
IDENTIFIER: 2.2.3.1.1

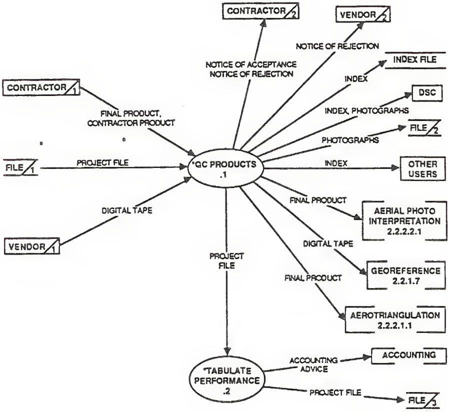
DFD: 21 OF 26
DATE: 5-17-88
LEVEL: 5

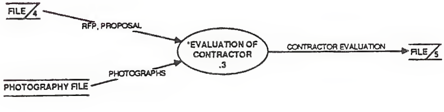



CONTRACTOR 1
PROPOSALS
CONTRACT FILE 2
SELECTION CRITERIA
*SELECTION AND CONTRACT ISSUE .2
CONTRACT
AEROTRIANGULATION 2.2.2.1.1
CONTRACT
CONTRACTOR 2
CONTRACT
AERIAL PHOTO INTERPRETATION 2.2.2.2.1
CONTRACT
FILE 2
CONTRACT
CARTOGRAPHIC MODELING 2.2.2.3.1.1

TECHNICAL ACTIVITIES: MAPPING SCIENCES
PARENT PROCESS NAME: FOLLOW-UP PRODUCTS
IDENTIFIER: 2.2.2.3.1.2

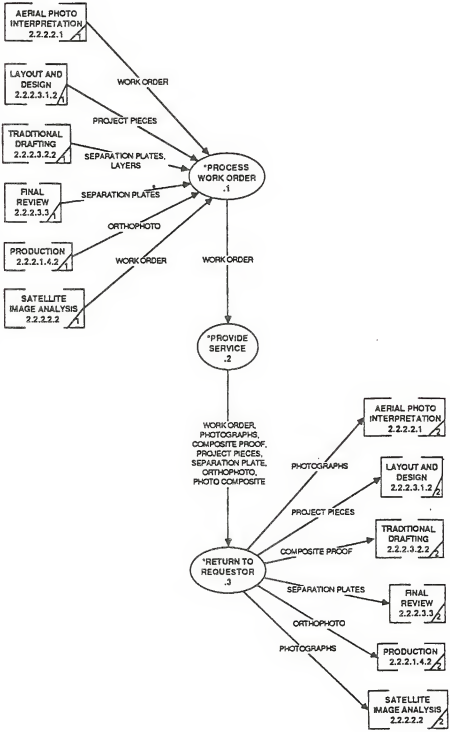
DFD: 22 OF 26
DATE: 5-17-88
LEVEL: 5





TECHNICAL ACTIVITIES: MAPPING SCIENCES
PARENT PROCESS NAME: PHOTOGRAPHIC REPRODUCTION
IDENTIFIER: 2.2.2.3.2

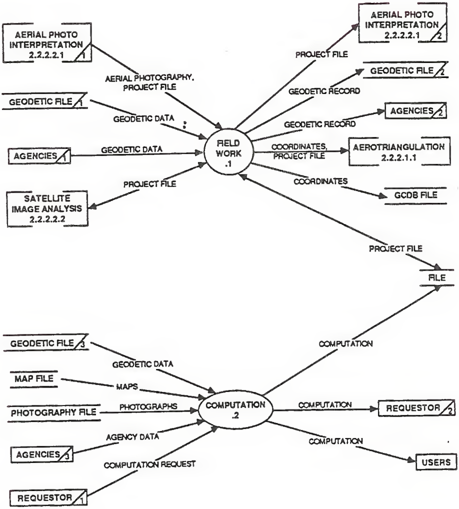
DFD: 23 OF 26
DATE: 5-17-88
LEVEL: 4


AERIAL PHOTO INTERPRETATION 2.2.2.2.1 1
LAYOUT AND DESIGN 2.2.2.3.1.2 1
TRADITIONAL DRAFTING 2.2.2.3.2.2 1
FINAL REVIEW 2.2.2.3.3 1
PRODUCTION 2.2.2.1.4.2 1
SATELLITE IMAGE ANALYSIS 2.2.2.2.2 1
WORK ORDER
PROJECT PIECES
SEPARATION PLATES, LAYERS
SEPARATION PLATES
ORTHOPHOTO
WORK ORDER
°PROCESS WORK ORDER .1
WORK ORDER
°PROVIDE SERVICE .2
WORK ORDER, PHOTOGRAPHS, COMPOSITE PROOF, PROJECT PIECES, SEPARATION PLATE, ORTHOPHOTO, PHOTO COMPOSITE
°RETURN TO REQUESTOR .3
PHOTOGRAPHS
PROJECT PIECES
COMPOSITE PROOF
SEPARATION PLATES
ORTHOPHOTO
PHOTOGRAPHS
AERIAL PHOTO INTERPRETATION 2.2.2.2.1 2
LAYOUT AND DESIGN 2.2.2.3.1.2 2
TRADITIONAL DRAFTING 2.2.2.3.2.2 2
FINAL REVIEW 2.2.2.3.3 2
PRODUCTION 2.2.2.1.4.2 2
SATELLITE IMAGE ANALYSIS 2.2.2.2.2 2

PHOTOGRAPHIC REPRODUCTION (MAPPING SCIENCES) 5/3/88 MB

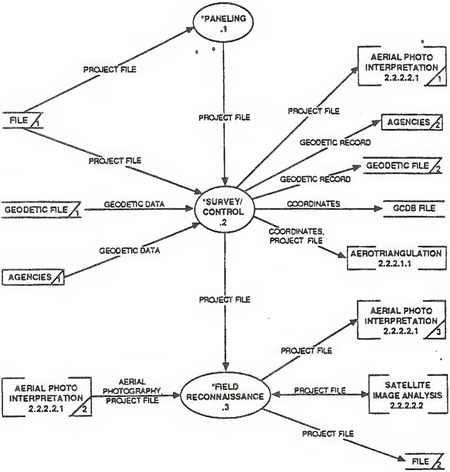
TECHNICAL ACTIVITIES: MAPPING SCIENCES
PARENT PROCESS NAME: GEODETIC AND FIELD ANALYSIS
IDENTIFIER: 2.2.3.3

DFD: 24 OF 26
DATE: 5-17-88
LEVEL: 4



TECHNICAL ACTIVITIES: MAPPING SCIENCES
PARENT PROCESS NAME: FIELD WORK
IDENTIFIER: 2.2.3.3.1

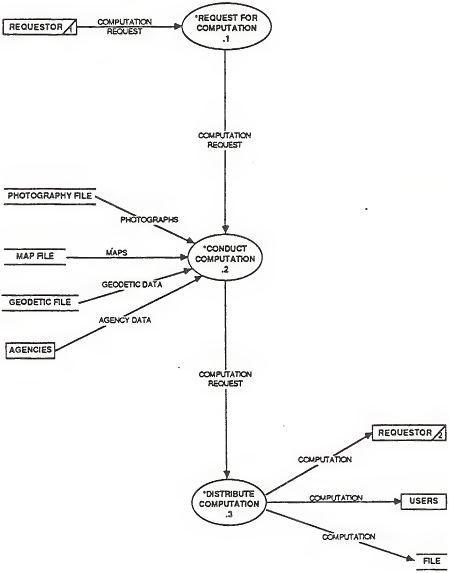
DFD: 25 OF 26
DATE: 5-17-88
LEVEL: 5



FIELD WORK (MAPPING SCIENCES) 6/3/88 MB

TECHNICAL ACTIVITIES: MAPPING SCIENCES
PARENT PROCESS NAME: COMPUTATION
IDENTIFIER: 2.2.2.3.3.2

DFD: 26 OF 26
DATE: 5-17-88
LEVEL: 5



COMPUTATION (MAPPING SCIENCES) 6/3/88 MB

CHAPTER 3

PROCESS LIST

The following table lists all processes defined on the Data Flow Diagrams appearing in Section 2. The Section 2 page reference is next to each process. If the process is at a primitive level, i.e., functionally decomposed to a level at which no benefits are derived from further decomposition, a reference to the Section 4 narrative for that process is also listed.

PROCESS LIST

Identifier	Process Name	Level	DFD	IPO
2.2.1.6	Acquire Source Data	4	2-10	4-12
2.2.2.2.1	Aerial Photo Interpretation	5	2-17	4-26
2.2.2.1.1	Aerotriangulation	5	2-14	4-16
2.2.2.3.1.1	Cartographic Modeling	6	2-20	4-31
2.2.2.3	Cartography	4	2-13	
2.2.2.3.2	Composition	5	2-19	
2.2.3.3.2	Computation	5	2-29	
2.2.3.3.2.2	Conduct Computation	6	2-31	4-55
2.2.3.1.1	Contract Award	5	2-25	
2.2.3.1	Contracting	4	2-22	
2.2.2.3.2.1	Digital Data Capture	6	2-21	4-34
2.2.3.3.2.3	Distribute Computation	6	2-31	4-56
2.2.2.1.8	Distribution	5	2-15	4-25
2.2.2.3.4	Distribution of Products	5	2-19	4-38
2.2.2.1.4.1	Establish File	6	2-16	4-20
2.2.3.1.2.3	Evaluation of Contractor	6	2-27	4-45
2.2.3.3.1.3	Field Reconnaissance	6	2-30	4-52
2.2.3.3.1	Field Work	5	2-29	
2.2.3.3.3	Final Review	5	2-19	4-37
2.2.3.1.2	Follow-Up Products	5	2-25	
2.2.1.4.4	Funding	5	2-11	4-10
2.2.3.3	Geodetic and Field Analysis	4	2-24	
2.2.1.7	Georeference	4	2-10	4-13

PROCESS LIST

Identifier	Process Name	Level	DFD	IPO
2.2.3.1.1.1	Issue Proposal	6	2-26	4-39
2.2.2.3.1.2	Layout and Design	6	2-20	4-32
2.2.2	Mapping Sciences Processing	3	2-7	
2.2.2.1.4	Orthophoto Production	5	2-14	
2.2.3.3.1.1	Paneling	6	2-30	4-49
2.2.2.1	Photogrammetry	4	2-12	
2.2.2.1.6	Photogrammetric Compilation	5	2-15	4-23
2.2.3.2	Photographic Reproduction	4	2-23	
2.2.1.4	Planning	4	2-9	
2.2.2.3.1	Process Data	5	2-19	
2.2.3.2.1	Process Work Order	5	2-28	4-46
2.2.2.1.3	Produce DEMs	5	2-14	4-19
2.2.2.1.4.2	Production	6	2-16	4-21
2.2.1.5	Project Decision	4	2-9	4-11
2.2.1	Project Definition	3	2-6	
2.2.1.1	Project Initiation	4	2-9	4-2
2.2.1.2	Project Scoping	4	2-9	4-5
2.2.3.2.2	Provide Service	5	2-28	4-47
2.2.3.1.2.1	QC Products	6	2-27	4-42
2.2.2.2	Remote Sensing	4	2-13	
2.2.2.2.3	Remote Sensing Distribution	5	2-18	4-30
2.2.3.3.2.1	Request for Computation	6	2-31	4-54
2.2.3.2.3	Return to Requestor	5	2-28	4-48

PROCESS LIST

Identifier	Process Name	Level	DFD	IPO
2.2.2.1.7	Review of Compilation	5	2-15	4-24
2.2.2.2.2	Satellite Image Analysis	5	2-17	4-28
2.2.3.1.1.2	Selection and Contract Issue	6	2-26	4-41
2.2.1.3	Selection of Methodology	4	2-9	4-6
2.2.1.4.1	Source Evaluation	5	2-11	4-7
2.2.1.4.2	Staffing	5	2-11	4-8
2.2.3	Support Functions	3	2-8	
2.2.3.3.1.2	Survey/Control	6	2-30	4-50
2.2.3.1.2.2	Tabulate Performance	6	2-27	4-44
2.2.1.4.3	Technical Assistance	5	2-11	4-9
2.2.1.8	Technical Specification	4	2-10	4-15
2.2.2.1.5	Terrain Analysis	5	2-15	4-22
2.2.2.1.2	Terrestrial Photogrammetry	5	2-14	4-18
2.2.2.3.2.2	Traditional Drafting	6	2-21	4-35

CHAPTER 4

INPUT/PROCESS/OUTPUT NARRATIVES

The following narratives describe the detail processing accomplished at the primitive level as defined by the Data Flow Diagrams. Included in each narrative is the following information:

1. the process name;
2. the identifier or process number;
3. the parent process name (the parent's identifier can be derived by omitting the last digit of the process identifier);
4. a general description of the process;
5. any applicable policies and procedures;
6. any constraints that may affect processing; and
7. the input/process/output narrative.

The process narratives appear in the order they are defined in the Data Flow Diagrams in Section 2.

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Project Initiation
Identifier:	2.2.1.1
Parent Process Name:	Project Definition
Description:	This process is driven by a request from the field, management, private sources, Washington Office, etc., or self-initiation of a project to spatially represent the earth, or objects on it, or to conduct research. It could be joint request or venture. The request may be written or verbal, but if it is verbal, a written follow-up is required. The BLM reaches a decision of feasibility, from both a management and technical point of view. Both must be feasible. For example: it can be done and there is the money to do it. If the decision is "no," this is not a total rejection, but there is usually a suggested alternative. If the decision is "yes," then further project definition and planning start.
Policies/Procedures:	None.
Constraints:	Some requestor material may be proprietary.

Input	Process	Output
Verbal Request (Requestor)	Receive a Verbal Request from a potential user of the Mapping Sciences information. Or, Mapping Sciences personnel may initiate a project, such as for research and development tailored to a BLM situation.	
	Determine which of the three processes (Photogrammetry, Remote Sensing, Cartography) is appropriate.	
	Discuss the technical aspects and do some preliminary research into budget, time, etc.	
	Give a Tentative Approval and request a formal memo.	Tentative Approval (Requestor)

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
Written Request, Project Maps (Requestor) Request for Final Plat Preparation (Cadastral Surveys: Examination and Preparation of Final Returns) Control Coordinates, Mapping Request (Engineering: Data Compilation) Request for Supplemental/Administrative Plat Folder (Cadastral Surveys: Preparation of Supplemental/Administrative Plats) Request for Aerial Photo (Cadastral Surveys: Survey Data Collection)	Upon receipt of a written request and supporting material, conduct a technical evaluation.	
	Determine if other Federal Agencies or Other Entities should share in the expense or work. Develop agreement with other agencies/entities for funding or work support.	Agreement (Other Entities, Federal Agencies)
Agreement (Agencies/Entities)	Receive confirmation from Agencies/Entities.	
	Create Project File by project name (unique identifier).	

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
Maps (Map File)	Begin to examine control.	
	Reach initial decision and timing. Notify Requestor of acceptance or rejection (temporary, permanent, or alternative).	Acknowledgement Letter (Requestor)
	If no further action needed, send Project File to File.	Project File (File)
	Send Project File to Project Scoping process.	Project File (Project Scoping)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Project Scoping

Identifier: 2.2.1.2

Parent Process Name: Project Definition

Description: This process precisely outlines the project.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (Project Initiation)	Examine a number of factors that would impact on the project, such as use, scale, contour interval, data themes (e.g., vegetation, primary roads/trails, drainage), digital/conventional (e.g., for digital, GIS, Autocad, Digital Line Graphs), timing (e.g., historical map or current), film type.	
	Send Project File to Selection of Methodology process.	Project File (Selection of Methodology)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Selection of Methodology

Identifier: 2.2.1.3

Parent Process Name: Project Definition

Description: Determine the approach, audience, and limits.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (Project Scoping)	Continue the analysis of the project.	
	Determine if support is needed from another Mapping Sciences process.	
	Determine the approach, audience, and limits of the project. What themes are necessary?	
	For Cartography and Photogrammetry, determine manual or digital processing.	
	For Remote Sensing, decide on aerial photography and/or satellite imagery.	
	Send Project File to Source Evaluation process.	Project File (Source Evaluation)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Source Evaluation

Identifier: 2.2.1.4.1

Parent Process Name: Planning

Description: This process gathers background and conducts research on the project.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (Selection of Methodology)	Determine if any federal, state, local, or private agency is doing any work related to the project. Look for work or cost sharing opportunity.	
Photographs (Requestor, Photography File)	Determine if interpretation analysis (i.e., photo interpretation) or monitoring activities (photography taken over time) is being tasked. Receive photographs from Requestor or from files. Determine what photography exists, who has it, and what needs to be contracted out.	
	Determine if satellite coverage is appropriate.	
	If new photographs or images are needed, determine cost and send Cost Estimate to Requestor.	Cost Estimate (Requestor)
Cancel Project (Requestor, Management)	The Requestor or Management may decide to cancel the project due to lack of funding support or change in priorities. Send Project File to File.	Project File (File)
	Send Project File to Staffing process.	Project File (Staffing)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Staffing

Identifier: 2.2.1.4.2

Parent Process Name: Planning

Description: This process determines what staffing is needed to complete the project.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (Source) Evaluation)	Determine how many people/hours are needed to accomplish the project.	
	Management will decide if it can be done in-house or needs to be contracted out or requires a change in time frame.	
	Send Project File to Technical Assistance.	Project File (Technical Assistance)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Technical Assistance
Identifier:	2.2.1.4.3
Parent Process Name:	Planning
Description:	This process determines what technical assistance, expertise, or equipment is needed to complete the project.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Staffing)	Determine what technical assistance is required to get the job done.	
	Determine if it is necessary to contract out, use in-house capabilitiy, or DSC expertise.	
	If it is necessary to use the expertise at the DSC, call the DSC and arrange for assistance/equipment and production.	Assistance Request (DSC)
Assistance Reply (DSC)	The DSC will confirm the request.	
	Send Project File to Funding process.	Project File (Funding)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Funding

Identifier: 2.2.1.4.4

Parent Process Name: Planning

Description: This process determines what funding is necessary to complete the project.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (Technical Assistance)	Determine approximate cost of proposed project and workmonth requirements.	
AWP, PAWP, Agreement (File)	Compare funding and workmonths needed with amount available and other sources of funding.	
Map Funding (Planning and Budgeting)	Get all funding citations from Planning and Budget that will be used for the project, including Bureau, Contributed, and Reimbursable Funds. Add these to the Project File for use during the entire project.	
	Determine alternatives such as federal, state, local, or private sources.	
	Make final decision concerning funding.	
	Send Project File to Project Decision process.	Project File (Project Decision)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Project Decision
Identifier:	2.2.1.5
Parent Process Name:	Project Definition
Description:	If the decision is "no," the project is deferred; if the decision is "yes," then determine the future direction for accomplishment of the project -- in-house, contracted out, or combination. Layout the project. Look at everything to determine what there is to work with -- the source data. Evaluate each factor and weigh them. For example, assess adequacy of the photographs and determine whether new photographs are needed and what scale is required.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Funding)	Management makes yes/no decision, and, if no, whether to propose an alternative or defer.	
	Notify Requestor of the decision, and if the decision is to proceed, when it will start and personnel involved. If the decision is no, advise the requestor of the alternative or deferment.	Mapping Sciences Decision (Requestor)
	For a negative response, send Project File to File.	Project File (File)
	Send Project File to Acquire Source Data process.	Project File (Acquire Source Data)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Acquire Source Data

Identifier: 2.2.1.6

Parent Process Name: Project Definition

Description: This process collects the necessary data for the project.

Policies/Procedures: None.

Constraints: Some sources may be proprietary.

Input	Process	Output
Project File (Project Decision)	Investigate and determine potential sources of information.	
DLGs, DEMs (USGS) Satellite Imagery (Imagery File) Photographs (Photography File) Records Data, Status Data (Case Recordation) Agency Data (Agencies) Land Net Grid, PLSS Data (PLSS) Vector Data, Resource Data (GIS) Resource Data (Field File) Maps (Map File) Orthophoto (File) Drill Hole Data (Drill Hole Sources)	Collect and evaluate data and information.	
	Send Project File to Georeference process.	Project File (Georeference)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Georeference
Identifier:	2.2.1.7
Parent Process Name:	Project Definition
Description:	Control is any map or ground reference data with determined coordinate values. Research all known existing control data, anything with coordinate value, determine who established it, and evaluate its accuracy. Plan which control points are to be used.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Acquire Source Data) Photographs (Photography File) Maps (Map File) Digital Tape (QC Products)	Examine the Project File and supporting material to determine type of control and where available. Determine what additional control must be established.	
	Create Project Map (control, boundaries, etc). Indicate what photography or maps are available. Mark maps and photos as necessary. Create overlays.	
	Control decisions include: what is there and how good, what control is needed.	
	If satellite imagery is involved for Remote Sensing, select ground control points (planimetric features) and georeference those points digitally on a display device.	

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
	If project needs to be contracted out, send Project File to Technical Specification process.	Project File (Technical Specification)
	Determine Mapping Sciences process and send Project File to Aerotriangulation for Photogrammetry, to Aerial Photo Interpretation or Satellite Image Analysis for Remote Sensing, or to Cartographic Modeling for Cartography.	Project File (Aerotriangulation, Aerial Photo Interpretation, Satellite Image Analysis, Cartographic Modeling)
	Send Digital Tape to Satellite Image Analysis process.	Digital Tape (Satellite Image Analysis)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Technical Specification
Identifier:	2.2.1.8
Parent Process Name:	Project Definition
Description:	If to be contracted out, write the specifications that will go with the contract.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Georeference)	Determine from the Project File what specifications are needed to support a contract.	
	Write technical specifications and send to Issue Proposal for inclusion into proposal.	Technical Specifications (Issue Proposal)
	Send Project File to File.	Project File (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Aerotriangulation

Identifier: 2.2.2.1.1

Parent Process Name: Photogrammetry

Description: Aerotriangulation (AT) is a process for extension of survey control whereby overlapping aerial photographs are related using perspective principles. The stereo paired photos and control are tied together. PUG or Point Marking is a procedure of designating discrete photographic locations for pass points, tie points, or control stations by physically marking the emulsion of a print or diapositive (film positive of photographic image). When corresponding image points are marked on overlapping photographs, the procedure is referred to as point transferring.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File, Photographs (File) Project File (Georeference) Contract (Selection and Contract Issue) Project File (Survey/Control) Coordinates (Survey/Control) Final Product (QC Products)	Transfer control points to photographs (they are assigned a coordinate value).	
	If necessary, use spot photography (small format camera photograph of a section corner or control point) to verify the panel or to add the panel to the aerial shot.	

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
	A Coordinate Listing for coordinate values for all points on the photography has been created.	
	Create a master diagram (a cross referencing system for tracking control) with all positions shown. It becomes a listing of control cross references.	
	Send Project File and Coordinate Listing to Photogrammetric Compilation process if traditional compilation, or to Produce DEMs if they are required.	Project File, Coordinate Listing (Photogrammetric Compilation, Produce DEMs)
	Send Project File to Terrestrial Photogrammetry process if ground based camera system.	Project File (Terrestrial Photogrammetry)
	Send Section/Meander Coordinate Listing to Cadastral Surveys if the AT is the end product.	Section/Meander Coordinate Listing (Cadastral Surveys: Survey Data Collection)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Terrestrial Photogrammetry
Identifier:	2.2.2.1.2
Parent Process Name:	Photogrammetry
Description:	Terrestrial photogrammetry is used for ground based camera system work such as archeology sites, historical sites, and dams.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Aerotri-angulation)	For ground based photography, map out the project and send to the Requestor/Users and as appropriate to the National Archives.	Products (Requestor, Users, National Archives)
	Send Project File to File.	Project File (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Produce DEMs
Identifier:	2.2.2.1.3
Parent Process Name:	Photogrammetry
Description:	In this process, the aerial photos (stereo pair) are scanned to gather digital elevation models (DEMs).
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File, Coordinate Listing (Aerotriangulation)	The diapositives are reoriented to the triangulated ground coordinates and then scanned to build digital elevation models.	
	The DEM and Control files are copied to magnetic tape for orthophoto projection, storage, and terrain analysis.	DEM, Control (Establish File, File, Terrain Analysis)
	The Project File is sent to Establish File and Terrain Analysis processes.	Project File (Establish File, Terrain Analysis)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Establish File
Identifier:	2.2.2.1.4.1
Parent Process Name:	Orthophoto Production
Description:	All entered information is put into files on the computer. The parameter program is run to ensure that the specified final product is within parameters.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
DEM, Control (Produce DEMs) Project File (Produce DEMs)	Receive DEM and Control magnetic tape. Create files for DEM and Control.	
	Set up parameters program. Run the program to check parameter of final product.	
	Send Parameter Files, Windowed DEM, and Project File to Production process.	Parameter Files, Windowed DEM, Project File (Production)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Production
Identifier:	2.2.2.1.4.2
Parent Process Name:	Orthophoto Production
Description:	Production involves a number of different technical activities. The interior orientation or the positioning of the photo in the projector is determined. The photo is also related to the ground (exterior orientation). Next is the measurement of the optical density of the photo to be projected, providing the operator with data to determine the setting for film exposure. The image of the diapositive is exposed onto film. As light scans through the diapositive onto the exposed film, the diapositive image is rotated and enlarged or reduced to a common scale.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Parameter Files, Windowed DEM, Project File (Establish File)	Determine the interior orientation of the photo, and set the absolute or exterior orientation of the photo.	
	Conduct rectification of aerial photography.	
	The Orthophoto is sent to Process Work Order for photo processing.	Orthophoto (Process Work Order)
Orthophoto (Return to Requestor)	The exposed orthophoto film has been processed and returned from photo reproduction.	
	Send Project File to Orthophoto processing (Layout and Design).	Project File (Layout and Design)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Terrain Analysis

Identifier: 2.2.2.1.5

Parent Process Name: Photogrammetry

Description: This process can be used for products such as coal production verification and reservoir volume estimation. This process may include subsurface modeling.

Policies/Procedures: None.

Constraints: Could involve proprietary data.

Input	Process	Output
Project File DEM, Control (Produce DEMs)	Conduct analysis, computation, or pictorial representation using DEMs and Digital Line Graph (e.g., GIS, Cadastral, and engineering for analysis). Send to Requestor/Users.	Products (Requestor, Users)
	Send Project File to File.	Project File (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Photogrammetric Compilation
Identifier:	2.2.2.1.6
Parent Process Name:	Photogrammetry
Description:	Compile the manuscript. This process creates a manuscript with the cartographic information portrayed. The Digital File may be output in hard copy or magnetic media.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File, Coordinate Listing (Aerotri-angulation)	Use coordinate values from listing and set the model (the overlap area between the two photos).	
	Plot out grid on overlay form that takes AT listing and plot on grid.	
	Transfer the coordinate value (x,y,z) of all mapped features to the Digital File.	
	The Project File, Digital File, and Compilation Manuscript are sent to Review of Compilation.	Project File, Compilation Manuscript, Digital File (Review of Compilation)
	The created Digital File and/or Map are sent to the File.	Digital File, Map (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Review of Compilation

Identifier: 2.2.2.1.7

Parent Process Name: Photogrammetry

Description: Review of manuscript and/or Digital File.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File, Compilation Manuscript, Digital File (Photogrammetric Compilation)	Check compilation and/or Digital File for missing or incorrect information and correct.	
	Send Compilation Manuscript and/or Digital File to Users.	Compilation Manuscript, Digital File (Users)
	Compilation Manuscript, Project File, and Digital File are sent to File.	Compilation Manuscript, Project File, Digital File (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Distribution
Identifier:	2.2.2.1.8
Parent Process Name:	Photogrammetry
Description:	Products are distributed.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (File)	Determine the distribution of anything generated by the task, including any combination of base map, themes, or coordinates. Distribute Products as required.	Products (Requestor, Users, Archive File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Aerial Photo Interpretation
Identifier:	2.2.2.2.1
Parent Process Name:	Remote Sensing
Description:	The process is used for processing contractor-supplied aerial photography.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Georeference) Contract (Selection and Contract Issue) Project File (Survey/Control)	Receive Project File from Contracting indicating that a Contractor has been selected, or from Georeference.	
Final Product (QC Products)	Receive Final Products with some kind of control on it.	
	If no analysis is required, send Photographs to the Requestor.	Photographs (Requestor)
	If analysis is required, field work is necessary. The type of work conducted will depend on the scope of analysis requested. Perform interpretation and use Field Reconnaissance to verify the analysis.	Aerial Photography, Project File (Field Reconnaissance)
Project File (Field Reconnaissance)	Receive Project File from Field Reconnaissance with completed field work.	
	The work with Field Reconnaissance is an iterative process involving validation and refinement.	

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
	This may require a preliminary analysis or product that is reviewed by the requestor.	
	Create tabular data summary or map.	
	If vegetation classification of satellite imagery is required, send Project File to Satellite Image Analysis process.	Project File (Satellite Image Analysis)
	Determine reproduction requirements, and send Work Order and supporting material to Process Work Order.	Work Order (Process Work Order)
Photographs (Return to Requestor)	Receive reproductive work.	
	Send Project File to Remote Sensing Distribution process.	Project File (Remote Sensing Distribution)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Satellite Image Analysis
Identifier:	2.2.2.2.2
Parent Process Name:	Remote Sensing
Description:	This process involves analysis of vendor-supplied imagery from an earth resource satellite.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File Digital Tape (Georeference)	Receive Project File and Digital Tape for analysis.	
Digital Tape (QC Products)	Receive Digital Tape from QC Products.	
	If no analysis is required, send Digital Tape (to include satellite image maps) to the requestor.	Digital Tape (Requestor)
	If analysis is required, field work is necessary.	
	The type of work conducted will depend on the scope of analysis requested.	
Project File (Aerial Photo Interpretation)	Continue with analysis and work: enhance the data, classify the imagery data (for vegetation classification) and evaluate imagery.	
	Send Project File to Field Reconnaissance to check data.	Project File (Field Reconnaissance)
Project File (Field Reconnaissance)	Receive Project File from Field Reconnaissance with completed field work.	

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
	The work with Field Reconnaissance is an iterative process involving validation and refinement. This may require a preliminary analysis or product that is reviewed by the requestor. If required, the data may be reclassified.	
	To facilitate analysis and interpretation, send Project File to Digital Data Capture.	Project File (Digital Data Capture)
Project File (Digital Data Capture)	Receive Project File from Digital Data Capture process.	
	Merge ancillary data sets and produce plots, photographs, or digital data files.	
	Determine reproduction requirements, and send Work Order and supporting material to Process Work Order.	Work Order (Process Work Order)
Photographs (Return to Requestor)	Receive complete reproductive work.	
	Send Project File to Remote Sensing Distribution process.	Project File (Remote Sensing Distribution)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Remote Sensing Distribution

Identifier: 2.2.2.2.3

Parent Process Name: Remote Sensing

Description: The BLM distributes the final product to the requestor.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (Aerial Photo Interpretation, Satellite Image Analysis)	Receive Project File from Remote Sensing processing.	
	Determine distribution. Conduct Technology Transfer by working with the users/requestors to show the processing and results.	
	Send Photographs and Reports to Requestor, Users, and File.	Photographs, Reports (Requestor, Users, File)
	Send Project File to File.	Project File (File)
	If appropriate, send Aerial Photo to Cadastral Surveys.	Aerial Photo (Cadastral Surveys: Survey Data Collection)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Cartographic Modeling
Identifier:	2.2.2.3.1.1
Parent Process Name:	Process Data
Description:	This process analyzes the data to determine the techniques for new combinations of data for the model. This process is accomplished both manually and automated.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Georeference) Contract (Selection and Contract Issue)	Receive the Project File from Georeference process.	
	Manipulate the data for combinations of themes and to overlay, separate, and combine systems.	
	Look at the model and determine if it answers the requestor's need.	
	Send Project File to Layout and Design process.	Project File (Layout and Design)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Layout and Design
Identifier:	2.2.2.3.1.2
Parent Process Name:	Process Data
Description:	This process describes how the final product is designed and created.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Cartographic Modeling) Project File (Production)	Make a composite base out of the separate pieces (hard copy or digital file) collected to create a mockup of final project. This may include registration of selected themes.	
	For digital products, design and layout specifications are translated to digital output files.	
	Hard copies are processed either through plotters or the photo laboratory.	
Project Pieces (Return to Requestor)	If necessary, send Project Pieces with specific instructions to the photo laboratory for processing. Receive Project Pieces from Return to Requestor process.	Project Pieces (Process Work Order)
	If necessary, meet with the requestor to determine the accuracy of the project. Requestor may review hard copy output or screen copy.	
Digital Tape (Computer)	Create Digital Tape and add to Project File.	

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
	Add final products to Project File. These products include Separation Plates and Composite Proof.	
	In some cases this is the final digital product; in other cases this is the preliminary product for the digitizing process.	
	If Digital File is the final product, send to Final Review process.	Digital File (Final Review)
	If project involves the digital process and is to be digitized, send Project File to Digital Data Capture process. If manual, send Project File to Traditional Drafting process.	Project File (Digital Data Capture, Traditional Drafting)

Process Name:	Digital Data Capture
Identifier:	2.2.2.3.2.1
Parent Process Name:	Composition
Description:	Digitizing is used to accurately reproduce or encode spatial data. Digitizing is the conversion of a space relationship or measurement to numerical values in which mapping or cross-section data is converted to computer form by a transducer and digitizer coupled to a recording system.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Layout and Design) Project File (Satellite Image Analysis)	Work with manuscripts to be digitized from the Project File (spatial data on some kind of hard copy media).	
	Create digital files of that data and incorporate, if necessary, existing supplemental digital data.	
Digital Files (Computer)	Verify data accuracy with hard or soft copy techniques.	
	Add product to Project File.	
Digital Tape (Computer)	Create Digital Tape and add to Project File.	
	Send Project File to Final Review and Satellite Image Analysis processes.	Project File (Final Review, Satellite Image Analysis)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Traditional Drafting

Identifier: 2.2.2.3.2.2

Parent Process Name: Composition

Description: Develop a negative engraving (scribing) or positive (inking) reproducible product.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (Layout and Design)	Examine layers and rework as necessary and clean up existing materials (extract information that is needed).	
	Part of the examination process is to inspect and develop if necessary a complete registration of the existing or new materials to be used.	
	Determine if old materials can be reused through modification, or if new material needs to be developed. If using the old, decide if the material or media inked (positive) or scribed (negative) are in the same format.	
	If necessary, new additional separates must be generated at this stage.	
Separation Plates (Map File)	Acquire existing Separation Plates.	
	If required, acquire PLSS as a theme for composite registration.	

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
	Create new layers of data themes that are extracted for the request.	
	Composite the layers and send to Photographic Reproduction.	Layers, Separation Plates (Process Work Order)
	Conduct quality control or edit review.	
Composite Proof (Return to Requestor)	Review Composite Proof to determine accuracy, content, registration, and quality control.	
	Coordinate the Composite with the requestor and make revisions as necessary.	
	As necessary, recomposite and go back to photographic reproduction.	
	Send Project File to Final Review process.	Project File (Final Review)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Final Review
Identifier:	2.2.2.3.3
Parent Process Name:	Cartography
Description:	Final review is conducted to obtain user concurrence of last composite proof.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Digital Data Capture, Traditional Drafting) Digital File (Layout and Design)	Review finished product with the requestor to determine accuracy, contents, registration, and quality of the total product.	
	If necessary, send Separation Plates to Photographic Reproduction for final compositing.	Separation Plates (Process Work Order)
Separation Plates (Return to Requestor)	Review and label product with final reproduction instructions. Add to Project File.	
	Send Project File to Distribution of Product process.	Project File (Distribution of Product)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Distribution of Products
Identifier:	2.2.2.3.4
Parent Process Name:	Cartography
Description:	This process describes distribution of the product to the requestor and notification to User Agencies (Libraries, Federal and State Agencies, Library of Congress, etc.).
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Final Review)	Distribute Final Product to requestor.	Final Product (Requestor)
	Send Final Product to Archive File.	Final Product (Archive File)
	For the digital process, send Digital Tape to Archive File.	Digital Tape (Archive File)
	Distribute Notice of Final Product to User Agencies.	Notice of Final Product (User Agencies)
	If appropriate, coordinate further reproduction with the requestor and Government Printing Office.	
	Send Project File to File.	Project File (File)
	If appropriate, send the Topographic Map to Engineering, and/or send the Final Plat to Cadastral Surveys.	Topographic Map (Engineering: Data Compilation) Final Plat (Cadastral Surveys: Examination and Preparation of Final Returns)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Issue Proposal

Identifier: 2.2.3.1.1.1

Parent Process Name: Contract Award

Description: This process issues the contract. Usually, the contract goes out as a package, but it can be split out by project area. For example, for photogrammetry, the contract will include information such as start time (after paneling), type of film, flight altitude, scale, what is needed, and direction of flight.

Policies/Procedures: None.

Constraints: The Request for Proposal (RFP) is controlled until issued. There is also control over dollar thresholds.

Input	Process	Output
Technical Specifications (Technical Specification) RFP Format (Contract File)	Receive Technical Specifications and add to Request for Proposal (RFP) Format to initiate a contract.	
	Decide whether to contract out locally or to send to the DSC for support (the DSC could contract out using the same method).	
	If the DSC is to handle the effort by contract or by DSC staff, send the RFP to the DSC.	RFP (DSC)
Cancel Project (Requestor, Management)	The Requestor or Management may cancel the project because of a lack of funding support or a change of priorities. Send Project File to File.	Project File (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
	Issue the RFP to the Public by way of the Commerce Business Daily and/or other appropriate advertising.	RFP (Public)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Selection and Contract Issue
Identifier:	2.2.3.1.1.2
Parent Process Name:	Contract Award
Description:	The Proposals are evaluated, and a Contractor is chosen.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Proposals (Contractor)	Receive Proposals from prospective Contractors.	
Selection Criteria (Contract File)	Form a selection committee to evaluate the proposals.	
	Evaluate the proposals and select the Contractor.	
	Notify successful Contractor of selection and issue Contract.	Contract (Contractor)
	Send Contract to File.	Contract (File)
	Send Contract to Aerial Photo Interpretation, Cartographic Modeling, Aerotriangulation processes.	Contract (Aerial Photo Interpretation, Cartographic Modeling, Aerotriangulation)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: QC Products

Identifier: 2.2.3.1.2.1

Parent Process Name: Follow-up Products

Description: This process describes the quality control (QC) procedure for products such as aerial photographs, maps, digital files, and satellite imagery data to establish contract compliance and mapping quality before accomplishing mapping.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Project File (File) Contractor Product (Contractor)	Check products received from the Contractor with the contract requirements. Check for sharpness, cloud, shadow, scale, proper coverage, flight line, and spacing for aerial photography. Check data content, accuracy, quality, and timeliness of cartographic products.	
Digital Tape (Vendor)	Receive Digital Tape from Vendor and process the tape to preview the image on a display device.	
	Evaluate the satellite imagery to determine if it is acceptable based on contracted standards, such as no more than 10 percent cloud cover. Determine if it is necessary to request an additional tape (image).	
	Approve or disapprove the Contractor Product. If disapproved, notify the Contractor to reaccomplish.	Notice of Rejection (Contractor)

INPUT/PROCESS/OUTPUT NARRATIVES

Input	Process	Output
Contractor Product (Contractor)	Review new products from the Contractor.	
	If the product is accepted, notify the Contractor to produce final prints of the final product.	Notice of Acceptance (Contractor)
Final Product (Contractor)	Reinspect the Final Product.	
	If digital tape is necessary, send Notice of Rejection to Vendor.	Notice of Rejection (Vendor)
Digital Tape (Vendor)	Receive new Digital Tape from Vendor, process the tape, and evaluate the imagery.	
	If requested, produce photographs from the imagery.	
	Store everything in the File and send a copy of the photographs to the DSC.	Photographs (File, DSC)
	Send Index to Index File, DSC, and Other Users.	Index (Index File, DSC, Other Users)
	Send Final Product to Aerial Photo Interpretation and Aerotriangulation processes.	Final Product (Aerial Photo Interpretation, Aerotriangulation)
	Send Digital Tape to to Georeference process for processing to register data to a map base.	Digital Tape (Georeference)
	Send Project File to Tabulate Performance.	Project File (Tabulate Performance)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Tabulate Performance
Identifier:	2.2.3.1.2.2
Parent Process Name:	Follow-Up Products
Description:	Examine negatives and prints for contract compliance.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (QC Products)	Determine the amount of money owed to the contractor or vendor based on the acceptance of the products.	
	Prepare Accounting Advice and send to Accounting (FMS).	Accounting Advice (Accounting)
	Send Project File to File.	Project File (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Evaluation of Contractor
Identifier:	2.2.3.1.2.3
Parent Process Name:	Follow-Up Products
Description:	Evaluate the contractor for future contract work.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Photographs (Photography File) RFP, Proposal (File)	Examine photographs, RFP, and Proposal to determine quality of Contractor work and suitability of Contractor for future contracts.	
	File Contractor Evaluation.	Contractor Evaluation (File)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Process Work Order

Identifier: 2.2.3.2.1

Parent Process Name: Photographic Reproduction

Description: Receive the Work Order for reproductive services.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Work Order (Aerial Photo Interpretation) Project Pieces (Layout and Design) Separation Plates, Layers (Traditional Drafting) Separation Plates (Final Review) Orthophoto (Production) Work Order (Satellite Image Analysis)	Analyze Work Order and accompanying material to determine scope of work and whether it can be done in-house or other support must be obtained such as contracting out or DSC.	
	Send Work Order to Provide Service process.	Work Order (Provide Service)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Provide Service

Identifier: 2.2.3.2.2

Parent Process Name: Photographic Reproduction

Description: Technical laboratory work.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Work Order (Process Work Order)	Receive the Work Order and perform the reproductive work that needs to be accomplished.	
	May require intermediate interface with the original requestor and additional work before the initial order is fully processed.	
	Depending on the nature of the request, quality control is necessary before all work is completed. Determine whether this effort can be accomplished in a timely manner or the requestor must be contacted at a remote location. The staff may make an intermediate decision with necessary concurrence at a later date.	
	Send Work Order with accompanying reproductive work to Return to Requestor process.	Work Order, Photographs, Composite Proof, Project Pieces, Separation Plates, Orthophoto, Photo Composite (Return to Requestor)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name: Return to Requestor

Identifier: 2.2.3.2.3

Parent Process Name: Photographic Reproduction

Description: Return the reproductive product to the requestor.

Policies/Procedures: None.

Constraints: None.

Input	Process	Output
Work Order, Photographs, Composite Proof, Project Pieces, Separation Plates, Orthophoto, Photo Composite (Provide Service)	From the Work Order, determine the distribution for the photography.	
	Send reproductive work to various processes that had initiated the work order and other users as appropriate.	Photographs (Aerial Photo Interpretation) Photographs (Satellite Image Analysis) Composite Proof (Traditional Drafting) Separation Plates (Final Review) Project Pieces (Layout and Design) Orthophoto (Production)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Paneling
Identifier:	2.2.3.3.1.1
Parent Process Name:	Field Work
Description:	Panels are used to identify the points to be seen in the photographs. The decision on panel size is based on the scale of the photography.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (File)	Identify paneling points.	
	Ask owner's permission if necessary.	
	Put panels down so that they are visible.	
	As necessary, work with the pilot: indicate path of approach and best possible time (consider shadows), and identify on a quad map.	
	When the paneling control and cadastral points are completed, check the area covered by photographs.	
	Send Project File to Survey/Control process.	Project File (Survey/Control)

INPUT/PROCESS/OUTPUT NARRATIVES

Process Name:	Survey/Control
Identifier:	2.2.3.3.1.2
Parent Process Name:	Field Work
Description:	This process conducts a survey, identifies coordinates for the panel control points, and establishes control on the ground. The purpose of survey is to travel to a point and tie down known control. Field work uses geodetic control point survey -- horizontal and/or vertical survey.
Policies/Procedures:	None.
Constraints:	None.

Input	Process	Output
Project File (Paneling) Project File (File) Geodetic Data (Geodetic File)	Extend geodetic coordinates into the project area. Check to ensure that preliminary computations and field notes are correct.	
	Locate monuments tied to national geodetic survey control net and link with existing control. Plot out new extended control net.	
	Use aerial photos in the planning process to help locate positions to extend the control positives. Clear area as necessary.	
	Write descriptions of control points. If necessary, add a permanent monument.	
	Reduce field notes (averages, totals, sort, means).	

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Agency Data
Abbreviation	
Description	Agency Data is information maintained by a specific agency.
Data Type	Record
Ability to View	All
Ability to Update	Agency
Definition	$Agency Name/Address + $Date + $Data + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Agreement
Abbreviation	
Description	Generic term used for Memorandum of Agreement, Interagency Agreement , Memorandum of Understanding, Cooperative Agreement, or other terms to represent an agreement between mapping sciences and other agencies.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM, Agency, Entity
Definition	$Agency/Entity + $Date + [Memorandum of Agreement | Interagency Agreement | Memorandum of Understanding | Cooperative Agreement] + $Authorized Officers

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Annual Work Plan
Abbreviation	AWP
Description	The Annual Work Plan provides the basis for work and for the fiscal year.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	\$Originator + \$Date + \$Plan + \$Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Assistance Reply
Abbreviation	
Description	A document indicating the DSC's support of an Assistance Request.
Data Type	Record
Ability to View	All
Ability to Update	DSC
Definition	$Requestor Name/Address + $Date + $Technical Assistance + $Equipment + $Disposition

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Assistance Request
Abbreviation	
Description	A document requesting technical assistance and/or equipment from the DSC to support mapping sciences work.
Data Type	Record
Ability to View	All
Ability to Update	BLM Office
Definition	$BLM Office + $Date + $Project + $Technical Assistance + $Equipment + $Schedule + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Cancel Project
Abbreviation	
Description	After a mapping sciences project has begun, the requestor or management may decide to cancel the project because of lack of funding or a change in priority.
Data Type	Record
Ability to View	All
Ability to Update	Requestor, Management
Definition	[$Requestor | $Management] + $Date + $Project + $Reason for Cancellation + $Authorization

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Compilation Manuscript
Abbreviation	
Description	Compilation is the production of a map, or portion of a map, from aerial photographs, geodetic control data, data theme, or other sources. Manuscript map is the original drawing of a map as compiled or constructed from various data. A Compilation Manuscript is a working guide for final map portrayal and portrays data themes on a hard copy from all necessary sources. The data themes are based on user requirements.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	Map + Data Themes

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Composite Proof
Abbreviation	
Description	Composite is a print containing the reproducible information from two or more color or shaded separation drawings surprinted in register. It is a preliminary final map (edited copy) on photo-like material. An orthophoto composite is a photo copy of the orthophoto with the land net grid or other themes.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	Map

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Computation
Abbreviation	
Description	A response to a requestor with the completed computation.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$Requestor Name/Address + $Date + $Computation Request + $Computation + $Authorized Officer + $Office

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Computation Request
Abbreviation	
Description	Request for computation which may include associated data and support material.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Requestor Name/Address + $Date + $Request + ($Data) + ($Support Material)

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Contract
Abbreviation	
Description	Legal agreement between the Government and a private contractor.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Notice + $Contractor Name/Address + $Financial Information + $Reporting + $Legal Responsibility + $Specifications + RFP

Data Name	Contract Evaluation
Abbreviation	
Description	In the mapping sciences area, each contractor is evaluated to determine how well the contractor performed and contractor's suitability for future contracts.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$Contractor Name/Address + $Project + $Date +$Evaluation + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Contractor Product
Abbreviation	
Description	Products delivered as a result of a contract -- also called deliverables.
Data Type	Aggregate
Ability to View	All
Ability to Update	All
Definition	Aerial Photography + Maps + Digital File + $Satellite Imagery Data

Data Name	Control
Abbreviation	
Description	A system of points with established geographic positions, which are used as fixed references in positioning and correlating map features. A ground control point is any point that has a known location on the earth's surface which can be identified in imagery.
Data Type	Element
Ability to View	All
Ability to Update	All
Definition	$Points

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Coordinates
Abbreviation	
Description	A set of numbers used in specifying the location of a point.
Data Type	Element
Ability to View	All
Ability to Update	All
Definition	$Points

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Coordinate Listing
Abbreviation	
Description	A hard copy listing of coordinates.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	Coordinates

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Cost Estimate
Abbreviation	
Description	The BLM determines a cost estimate for the project and sends it to the requestor.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$BLM Office + $Requestor Name/Address + $Date + $Project Description + $Cost Estimate + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Digital Elevation Model
Abbreviation	DEM
Description	A three-dimensional raster data set representing the surface of the earth or an object.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Numerical Description

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Digital File
Abbreviation	
Description	Computer file which organizes and stores digital data for access and retrieval.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Digital Information

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Digital Line Graph
Abbreviation	DLG
Description	Term used to describe a standard coordinate data structure used for the transmission of machine readable mapping data bases from the United States Geological Survey (USGS) to the user community.
Data Type	Element
Ability to View	All
Ability to Update	USGS
Definition	Coordinates

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Digital Tape
Abbreviation	
Description	The magnetic tape is the physical means to transport Digital Files information.
Data Type	File
Ability to View	All
Ability to Update	All
Definition	Digital Files

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Drill Hole Data
Abbreviation	
Description	Subsurface information from test or production drilling sources for mineral resources (e.g., oil and gas). May include information from the Coal Drill Hole Data Base System (COALSYS) and other sources of coal information concerning coal exploration and development drilling data.
Data Type	Record
Ability to View	BLM
Ability to Update	BLM
Definition	$Drill Hole Data + $Date + $Source + $Evaluation

Data Name	Final Product
Abbreviation	
Description	The Contractor delivers the final contracted product to the BLM (e.g., Manuscript, Digital Tape, Orthophoto).
Data Type	Aggregate
Ability to View	All
Ability to Update	Contractor
Definition	$Contractor Name/Address + $Date + $Project + Aerial Photographs + Photographs + $Other Contracted Products

Data Name	Geodetic Data
Abbreviation	
Description	Based on geodesy: the branch of surveying in which measurements are made for determining the shape of the earth including precise horizontal and vertical positions on its surface. The points have known precise positions in latitude, longitudes, and azimuths established by geodetic methods.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$General Description + $Latitude + $Longitude + $Azimuth + $Other Pertinent Data

Data Name	Geodetic Record
Abbreviation	
Description	Verification (positive or negative) of Geodetic Control Points.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Geodetic Data + $Confirmation + $Date + $Method + $Description

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Index
Abbreviation	
Description	An index map is a map showing location of collections of data which may be other maps, photos, statistical tables or descriptions. Also, a small scale map showing locations or other information about a survey or a project.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	Map

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Land Net Grid
Abbreviation	
Description	Land net grid is surveyed on protracted township section grid. A grid is a network composed of two sets of lines, each set drawn according to a definite pattern and intersecting the other in a definite pattern and arrangement. The term is frequently used to designate a plane-rectangular coordinate system superimposed on a map projection.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Protracted Township Section Grid

Data Name	Layers
Abbreviation	
Description	The hard copy overlays or digital files that represent Data Themes.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Data Themes

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Mapping Sciences Decision
Abbreviation	
Description	A decision sent to the requestor indicating if the project will be accepted or any other conditions that are relevant.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$BLM Office + $Date + $Project + $Decision + $Authorized Officer

<table>
<tr><td>Data Name</td><td>Maps</td></tr>
<tr><td>Abbreviation</td><td></td></tr>
<tr><td>Description</td><td>A representation on a plane surface at an established scale. A graphic representation of the earth's surface that illustrates selected themes (e.g., physical features, statistics, quantitative data, thematic data). Maps can show the legal land description and a graphic representation and include: Land Use/Classification Maps -- surface management, mineral management, topographic, geologic, wilderness status maps, and Known Leasing Areas; Resource Management Maps -- mineral resource, rangeland management (grazing allotment), wildlife habitat management maps, and botanical maps; population density, or land status map.</td></tr>
<tr><td>Data Type</td><td>Aggregate</td></tr>
<tr><td>Ability to View</td><td>All</td></tr>
<tr><td>Ability to Update</td><td>Government/Private Industry</td></tr>
<tr><td>Definition</td><td>[$Township | $Range | $County |$Graphic depiction | $Ownership]</td></tr>
</table>

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Map Funding
Abbreviation	
Description	Funding information from the Survey, Planning and Budgeting process to assist in determining who will pay for the mapping sciences effort.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$Funding Agency + $Funding + $Specifications

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Notice of Acceptance
Abbreviation	
Description	Acceptance of deliverables from the contractor after they have been checked by quality control.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$BLM Office + $Date + $Project + $Acceptance Decision + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Notice of Final Product
Abbreviation	
Description	After the completion of the cartographic process, the Bureau notifies other users of the new product that it is available for their use.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$BLM Office + $Date + $Product Description

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Notice of Rejection
Abbreviation	
Description	Rejection of deliverables from the contractor/vendor after they have been checked by quality control.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$BLM Office + $Date + $Project + $Rejection Decision + $Appeal Process + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Orthophoto
Abbreviation	
Description	Photograph with map-like qualities, in which image displacements caused by camera tilt and relief of terrain are removed.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	Photograph

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Parameter Files
Abbreviation	
Description	Hard copy listing of orientation of the aerial photography in relationship with the ground control coordinates -- accuracy check.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Listing + $XYZ

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Photo Composite
Abbreviation	
Description	Photo Composite is a print containing the reproducible information from two or more separation drawings surprinted in register.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	Map

Data Name	Photographs
Abbreviation	
Description	A general term for a positive or negative picture made with a camera on sensitized material, or prints made from a camera original. Photographs may include satellite image maps.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Photo

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	PLSS Data
Abbreviation	
Description	Data pertaining to the Public Land Survey System (PLSS), specifically corners, boundaries, metes and bounds, etc.
Data Type	Element
Ability to View	All
Ability to Update	All
Definition	$Coordinates

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Preliminary Annual Work Plan
Abbreviation	PAWP
Description	The Preliminary Annual Work Plan is the prototype vehicle for the AWP.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Originator + $Date + $Plan + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Products
Abbreviation	
Description	Includes anything generated by the mapping sciences request.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	[Map | Photographs | $Themes | $Coordinates | Digital Products]

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Project File
Abbreviation	
Description	A working file containing instructions, survey data, notes, maps, photos, and other pertinent information required for the mapping sciences work.
Data Type	Set
Ability to View	All
Ability to Update	BLM
Definition	$Special Instructions Document + Geodetic Control Data + $Public Land Record System Data + $Assignment Instructions + $Computational Data + Photographs + Maps + Agreement + $Other Material

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Project Maps
Abbreviation	
Description	Supporting documentation that relates to a particular project.
Data Type	Set
Ability to View	All
Ability to Update	BLM, Other Federal, Private
Definition	$Request + $Map Funding + $Support Material

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Project Pieces
Abbreviation	
Description	Same as Compilation Manuscript except these are separate parts that go into the Compilation Manuscript.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	Map + $Data Themes

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Proposals
Abbreviation	
Description	Proposal from a contractor bidding on a contract, including the technical and cost proposals. The technical proposal represents the technical approach to the work to be performed, while the cost proposal contains the bid.
Data Type	Aggregate
Ability to View	BLM
Ability to Update	Contractor
Definition	$Proposal Letter + $Personnel Qualification Statement + $Contractor History + $Financial History + $Equipment + $Proposed Technical Procedures + $Intended Subcontracting + $Proposed Schedule of Events + $Itemized Cost Estimate + $Bid Breakdown

Data Name	Records Data
Abbreviation	
Description	Case related information from Case Recordation.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Serial Number + $Case Type + $Applicant Information + $Legal Land Description + $Case Actions + $Remarks + $Case Status

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Reports
Abbreviation	
Description	Mapping Sciences generates reports which contain analyses and other data concerning the project.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Project Name + $Date + $Analysis + $Support Data + Maps + Photographs + $BLM Office + $Authorized Officer

Data Name	Request for Proposal
Abbreviation	RFP
Description	An RFP contains contract requirements, statement of work, and specifications to fulfill a particular Bureau need. It is used to initiate the bidding process.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Agency Name/Address + $Date of Issue + $Date due + $Contract Requirements + $Statement of Work + $Specifications + $Contract Officers Authorized Representative

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	RFP Format
Abbreviation	
Description	Files will contain a boilerplate for an RFP so that for a specific contract only the specifications have to be entered.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Government Contract Format + $Instructions for Completion

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Resource Data
Abbreviation	
Description	Data retrieved from the geographic information system and field files.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	$Source + $Date + $Data + $Supporting Documentation + $Evaluation

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Satellite Imagery
Abbreviation	
Description	Data generated from satellites, that consists of a type of grid cell spatial data that stores information for contiguous cells in a single logical data record.
Data Type	Element
Ability to View	All
Ability to Update	All
Definition	$Spatial Data

Data Name	Section/Meander Coordinate Listing
Abbreviation	
Description	A georeferenced coordinate listing of significant points of the PLSS.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Coordinate Listing

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Selection Criteria
Abbreviation	
Description	Criteria used to determine technical acceptance of a proposal from a prospective contractor.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$Type of Contract + $Selection Criteria

Data Name	Separation Plates
Abbreviation	
Description	Reproducible plates that may or may not be composited for reproduction.
Data Type	Aggregate
Ability to View	All
Ability to Update	BLM
Definition	($Scribe Coat | $Scribe Plate)

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Status Data
Abbreviation	
Description	Land status data such as data stored by Case Recordation.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$Legal Land Description

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Technical Specifications
Abbreviation	
Description	The mapping sciences specialists determine what the technical specifications will be for contracted work.
Data Type	Record
Ability to View	BLM
Ability to Update	BLM
Definition	$BLM Office + $Project + $Date + $Specifications

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Tentative Approval
Abbreviation	
Description	When a requestor initiates a request for Mapping Sciences work, the BLM may respond with a tentative approval indicating that it is being favorably looked at.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$Requestor Name/Address + $Date + $Project + $Decision + $Authorized Officer

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Vector Data
Abbreviation	
Description	Geographic data where map points, lines, and areas are represented by an actual or logical set of coordinates that if connected would form the features depicted on a map.
Data Type	Element
Ability to View	All
Ability to Update	All
Definition	Coordinates

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Verbal Request
Abbreviation	
Description	A requestor may make a verbal request by phone or in person for Mapping Sciences work.
Data Type	Record
Ability to View	All
Ability to Update	Requestor
Definition	$Requestor Name/Address + $Date + $Project + $Request

Data Name	Windowed DEM
Abbreviation	
Description	When parameters are set and a ground area defined, the DEMs within this area are the windowed DEM.
Data Type	Record
Ability to View	All
Ability to Update	All
Definition	$DEM

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Work Order
Abbreviation	
Description	Form used to request reproduction work.
Data Type	Record
Ability to View	All
Ability to Update	BLM
Definition	$Work Order Number + $Date of Request + $Date Due + $Requestor Name/Mail Code/Phone + $Project Name + $Charge Code + $Included Material + $Finished Product Needed + $Instructions

DATA DICTIONARY AND CROSS REFERENCE LIST

Data Name	Written Request
Abbreviation	
Description	A request from the requesting agency accompanied with pertinent survey data identifying what the requestor wants accomplished.
Data Type	Record
Ability to View	All
Ability to Update	Requestor
Definition	$Requestor Name/Address + $Date + $Fund Citation + $Date Due + $Request + ($Data) + ($Supporting Material)

DATA DICTIONARY AND CROSS REFERENCE LIST

Abbreviation	AWP
Data Name	Annual Work Plan
Abbreviation	DEM
Data Name	Digital Elevation Model
Abbreviation	DLG
Data Name	Digital Line Graph
Abbreviation	PLSS
Data Name	Public Land Survey System
Abbreviation	PAWP
Data Name	Preliminary Annual Work Plan
Abbreviation	RFP
Data Name	Request for Proposal